

September 25, 2002

What is claimed is:

1. A method of determining the distance (50) of a projection point (24) of a first imaging beam (22) of an imaging device (20) from a measuring point (28) of a measuring device (26) on the surface (10) of a printing form (12), both the projection point (24) of the first imaging beam (22) and the measuring point (28) of the measuring device (26) being movable in relation to the surface (10) of the printing form (12) and the positions of the imaging beam (22) and the measuring point (28) on the surface (10) of the printing form (12) being determinable in relation to a fixed point,
characterized by:
imaging of a first pattern (84) by the first imaging beam (22), as a function of the position of the imaging beam (22), on the printing form (12) in at least one direction (38, 40) which spans the surface (10) of the printing form (12); measurement of the reflected intensity of at least a part of the light illuminating the first pattern (84) as a function of the position of the measuring device (26); and forming the difference of the at least one position of the measuring device (26) and the correlated position of the imaging beam (22) in which the imaging beam was located as the part of the first pattern (84) was written.

2. The method of determining the distance (50) of a projection point (24) from a measuring point (28) as recited in Claim 1, wherein the imaged printing form (12) is inked using printing ink before the light reflection is measured.
3. The method of determining the distance (50) of a projection point (24) from a measuring point (28) as recited in Claim 1 or Claim 2, wherein imaging using the first pattern (84) is performed in two linearly independent directions (38, 40), which span the surface (10) of the printing form (12), and the distance is determined in both linearly independent directions (38, 40).
4. The method of determining the distance (50) of a projection point (24) from a measuring point (28) as recited in one of the preceding claims, wherein the measuring device (26) is a triangulation sensor.
5. The method of determining the distance (50) of a projection point (24) from a measuring point (28) as recited in one of the preceding claims, the surface (10) of the printing form (12) forming at least a part of a lateral surface of a rotating body, wherein an angle encoder (46) is used for determining the position in the peripheral direction, and a path measuring system (44) is used for determining the position in the translation direction, essentially parallel to the axis (18) of the rotating body.

6. The method of determining the distance (50) of a projection point (24) from a measuring point (28) as recited in one of the preceding claims, wherein the measurement of the reflected intensity is performed in a measuring raster (56), the axial directions (58, 60) of the measuring raster (56) being linearly independent of at least one direction of the imaging pattern (84).
7. The method of determining the distance (50) of a projection point (24) from a measuring point (28) as recited in one of the preceding claims, wherein measurements of the reflected intensity are performed in a measuring raster (56) which is finer than the imaging pattern (84).
8. The method of determining the distance (50) of a projection point (24) from a measuring point (28) as recited in one of the preceding claims, wherein the imaging pattern (84) has periodicity (90) in at least one direction (38, 40).
9. A method of determining the distance (54) of a first projection point (24) of a first imaging beam (22) of a first imaging device (20) from a second projection point (36) of a second imaging beam (34) of a second imaging device (32) on a surface (10) of a printing form (12), using a measuring point (28) of a measuring device (26), characterized by imaging of a first pattern (84) by the first imaging beam (22), as a function of the position of the imaging beam (22), on the printing

form (12) in at least one direction (38, 40) which spans the surface (10) of the printing form (12); imaging of a second pattern (86) by the second imaging beam (34), as a function of the position of the imaging beam (34), on the printing form (12) in at least one direction (38, 40) which spans the surface (10) of the printing form (12); measurement of the reflected intensity of at least a part of the light which illuminates the first pattern (84) as a function of the position of the measuring device (26); measurement of the reflected intensity of at least a part of the light which illuminates the second pattern (86) as a function of the position of the measuring device (26); and forming the difference of the at least one position of the measuring device (26) at a measuring point (28) in the second pattern (86) and the correlated position of the measuring device (26) at a measuring point (28) in the first pattern (84).

10. A method of determining the distance (54) of a first projection point (24) of a first imaging beam (22) of a first imaging device (20) from a second projection point (36) of a second imaging beam (34) of a second imaging device (32) on a surface (10) of a printing form (12),
characterized by determining the distance (50) of the first projection point (24) of the first imaging beam (22) from a measuring point (28) of a measuring device (26) on the surface (10) of the printing form (12) as recited in one of the preceding claims; determining the distance (52) of the second projection point (36) of the second imaging beam (34) from a measuring point

(28) of a measuring device (26) on the surface (10) of the printing form (12) as recited in one of the preceding claims; and forming the sum of the difference of the at least one position of the measuring device (28) [sic; (26)] and the position of the first imaging beam (22) and the difference of the at least one position of the measuring device (28) [sic; (26)] and the position of the second imaging beam (34).

11. The method of determining the distance (54) of a first projection point (24) from a second projection point (36) as recited in Claim 9, wherein the first imaging device (20) and the second imaging device (32) are identical.
12. The method of determining the distance (54) of a first projection point (24) from a second projection point (36) as recited in Claim 9 or 10, wherein the first pattern (84) imaged using the first imaging beam (22) and the second pattern (86) imaged using the second imaging beam (34) are at least partially in one another or transposed into one another.
13. A method of correcting the time triggering of a first imaging beam (22) of a first imaging device (22), using which a first projection point (24) may be produced on the surface (10) of a printing form (12), from a first triggering instant to a second triggering instant,

characterized by determining the distance (50, 56) of the first projection point (24) to a measuring point (28) or to a second projection point (36) using a method as recited in one of the preceding claims, the imaging beam (22) being activated at the first triggering instant;
forming the difference of the distance determined and a setpoint distance; and determining the second triggering instant as the sum of the first triggering instant and the time which is necessary to scan the difference with the first projection point (24), taking into consideration the relative speed of the first imaging beam (22) and the surface (10) of the printing form (12) in the orientation of the distance.

14. A method of correcting the time triggering of a measuring beam (27) of a measuring device (26), using which a measuring point (28) may be produced on a surface (10) of a printing form (12), from a first triggering instant to a second triggering instant, characterized by determining the distance (50, 56) of the measuring point (28) to a first projection point (22) using a method as recited in one of the preceding claims, the measuring point (28) being activated at the first triggering time; forming the difference of the distance established and a setpoint distance; and determining the second triggering time as the sum of the first triggering instant and the time which is necessary in order to scan the difference with the first projection point (22), taking into consideration the relative speed of the measuring beam (27) and the

surface (10) of the printing form (12) in the orientation of the distance.

15. A printing unit (16) having at least one first imaging device (20), a measuring device (26), and at least one control unit (28),
wherein the control unit (40) includes an electronic system having a memory unit, in which a computer program for determining a distance as recited in one of Claims 1 through 11 or for correcting a time triggering through a method as recited in Claim 12 or 13 is stored.
16. A printing press (17),
characterized by at least one printing unit (16) as recited in Claim 14 [sic; 15].